

ARMY AVIATION AND TACTICAL WHEELED VEHICLES: A SYSTEMIC RELATIONSHIP

A Monograph

by

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ABSTRACT

ARMY AVIATION AND TACTICAL WHEELED VEHICLES: A SYSTEMIC RELATIONSHIP, by Major Gary H. Gonzalez, 42 pages.

At first glance tactical wheeled vehicles may seem to be of limited utility to Army aviation. However, a closer examination reveals a systemic relationship. This monograph delves into this relationship. Vehicles represent both a critical requirement and a center of gravity for sustainment operations. Sustainment enables combat aviation brigade modularity, training, readiness, capability, and capacity. Although contested by Army aviation force design pundits, the Training and Doctrine Command ultimately accepted a methodology to reduce the tactical wheeled fleet. Interviewed subject matter experts of aviation sustainment, speaking to current and future implications, similarly decried the vehicle reductions. Still, those interviewed suggested some positive effects of the vehicle reductions. Sustainment case studies further illustrate the potential catastrophic effects of degraded sustainment, namely tactical and operational defeat.

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ACRONYMS

ACDS	Aircraft Cleaning and De-ice System
ADP	Army Doctrinal Publication
ALUMC	Aviation Light Utility Mobile Cart
ADRP	Army Doctrinal Reference Publication
AR	Army Regulation
ARCIC	Army Capability Integration Center
ARFORGEN	Army Forces Generation
ASL	Authorized Stockage List
CARL	Combined Arms Research Library
CASCOM	Combined Arms Support Command
CDID	Capability Development and Integration Directorate
CGSC	U.S. Army Command and General Staff College
CTA	Common Table of Allowance
COA	Course of Action
DOD	Department of Defense
DOTMLPF	Doctrine, Organization, Training, Materiel, Leadership, Personnel, Facility
FDD	Force Development Directive
FDU	Force Design Update
FM	Field Manual
HQDA	Headquarters, Department of Army
JP	Joint Publication
KBR	Kellog, Brown, and Root
LOGCAP	Logistics Civil Augmentation Program
LTV	Light Tactical Vehicle
PLL	Prescribed Load Listing
SAMS	School of Advanced Military Studies

SATS	Standard Aircraft Towing System
MMAS	Master of Military Art and Science
TASKORD	Task Order
TRADOC	Training and Doctrine Command
TWV	Tactical Wheeled Vehicle
USAACE	United States Army Aviation Center of Excellence
VSCA	Vice Chief of Staff of the Army

INTRODUCTION

He, therefore, who desires peace, should prepare for war. He who aspires to victory, should spare no pains to train his soldiers. And he who hopes for success, should fight on principle, not chance. No one dares to offend or insult a power of known superiority in action.

—Vegetius, *Military Institutions of the Romans*

The Army is currently in the process of reducing its entire tactical wheeled vehicle fleet by approximately fifty thousand. These reductions include the tactical wheeled fleet of Army aviation. Although the number of vehicles will be reduced, the mobility and transportability sustainment requirements that vehicles fulfill will remain unchanged. The authorization documents prescribing unit equipment will reflect this reduction. This means that units will no longer receive the number of vehicles required for sustainment in terms of logistics and maintenance. These reductions represent an attempt by the Army to improve fleet efficiencies by removing vehicles beyond their total life cycle utility and focusing on sustaining the remaining viable fleet. What are the implications of the reduction of tactical wheel vehicles for Army aviation? This monograph posits that there will be an overall decline in Army aviation organic readiness, capability and capacity, and ultimately the ability to support both the Army and Joint Forces ground commander. The result is potentially catastrophic for future combat operations.

This monograph first analyzes how organic tactical wheeled vehicles contribute to Army aviation, and by extension, the Army and those whom the Army will support. Next, the monograph will examine the development of the resultant methodology behind the reduction in the organic tactical wheeled fleet and Army aviation's response. Finally, the monograph will explore both the current and possible projected implications of the reductions for the future.

Section one discusses the contributions of the tactical wheeled vehicle fleet to Army aviation. The section begins with a description of how tactical wheeled vehicles enable an organic sustainment capability in terms of logistics and maintenance. Section two discusses the

development of the resultant methodology behind the reduction in the Army aviation tactical wheeled fleet. Section three explores the current and possible projected implications of the fleet reductions for the future by presenting interviews conducted by the author. The interviews conducted by the author with senior Army aviation sustainers with diverse backgrounds provide expert opinions and firsthand insights into the positive and negative effects of tactical wheeled vehicle reductions. Section four considers two case studies to provide a degree of historical perspective with respect to the results of poorly sustained forces in the face of conflict. The first case study traces the defense of Burma in World War II; the second reviews Task Force Smith from the Korean War. Both serve as poignant warnings and examples of the potential consequence of ill-sustaining units.

The conclusion of the monograph discusses operational defeat and catastrophic failure as an ultimate systemic effect of degraded sustainment. In general, neglecting any critical system within a system tends toward a holistic failure. The monograph closes with brief recommendations on how to proceed into the future.

ORGANIC TACTICAL WHEELED VEHICLE CONTRIBUTIONS

Tactical wheeled vehicles: a nested critical requirement

Arguably, the most significant contribution of Army aviation to the ground commander is the ability to adapt swiftly in dynamic operational environments and focus combat power at decisive points. The ground commander does this by leveraging the helicopter's inherent ability to compress time and distance through velocity. The Army modular combat aviation brigades provide an invaluable assortment of mission sets to the ground commander including command and control support, reconnaissance, security, close combat attack, interdiction attack, medical and casualty evacuation, personnel recovery operations, movement to contact, air assault, and air

movement. An intentionally designed organic sustainment capability within aviation brigades support these valuable aviation mission sets.

Organic sustainment capability is critical to Army aviation operations. Joint Publication 5-0, Joint Operation Planning defines critical capabilities as “those that are considered crucial enablers” and “essential to the accomplishment” of objectives.¹ Without sustainment, Army aviation would not be able to provide its mission sets to support the ground commander. In order for the sustainment capability, which is composed of maintenance and logistics, to function as intended it requires means to be mobile and transportable. First, helicopters certainly require considerable maintenance. FM 3-04.11, Aviation Brigades, speaks to this requirement succinctly, “The highly technical and complex aircraft of the aviation brigade require robust and redundant maintenance, repair, and ground support. Aviation maintenance must be fluid and able to adapt to the complexities and challenges of accelerated operating tempos and maximize the aviation brigade’s contribution to the overall ground component commander’s plan.”² Secondly, maintenance requires logistical support in the form of such items as tools, repair parts, lubricants, portable repair shops, computers, and vehicles. Vehicles fulfill the sustainment requirement of being transportable and mobile. In fact, for Army aviation, transportability and mobility are critical requirements for the sustainment capability. Transportability, as defined by Joint Publication 1-02, is “the capability of material to be moved by towing, self-propulsion, or carrier via any means, such as railways, highways, waterways, pipelines, oceans, and airways.” It defines mobility as “a quality or capability of military forces which permits them to move from place to

¹ Department of Defense, JP 5-0, *Joint Operation Planning*, (Washington, DC: Government Printing Office, August 2011), III-24.

² Department of the Army, FM 3-04.111, *Aviation Brigades* (Washington, DC: Government Printing Office, December 2007), 4-1.

place while retaining the ability to fulfill their primary mission.”³ These requirements are critical to Army aviation sustainment operations, specifically maintenance and logistics capabilities. Sustainment operations are simultaneously a critical capability and requirement for Army Aviation operations. Joint Publication 5-0, defines critical requirements as “the conditions, resources, and means that enable a critical capability to become fully operational.”⁴ In a field training or tactical environment, maintenance personnel and equipment must traverse long distances between aircraft locations daily in a timely manner in order to maintain aircraft in accordance with established technical and safety standards. Also of note, sustainment operations are often performed not only a scheduled basis, but also on an unscheduled basis as well. Tactical wheeled vehicles are part of a system that enables the sustainment capability to function as needed. They provide the means for sustainment to be mobile and transportable.

Furthermore, tactical wheeled vehicles, from a tactical level standpoint, demonstrate a center of gravity quality for Army aviation sustainment. Joint Publication 5-0, *Joint Operational Planning*, defines the term center of gravity as “source of power that provides moral or physical strength, freedom of action, or will to act.”⁵ This definition derives from Clausewitz’s seminal work, *On War*, in which he states, “one must keep the dominant characteristics of both belligerents in mind. Out of these characteristics a certain center of gravity develops, the hub of all power and movement, on which everything depends.”⁶ Sustainment is a dominant

³ Department of the Defense, JP 1-02, *Dictionary of Military and Associated Terms* (Washington, DC: Government Printing Office, April 2001), 352, 560.

⁴ Department of Defense, JP 5-0, *Joint Operation Planning*, (Washington, DC: Government Printing Office, August 2011), III-24.

⁵ Ibid., III-22.

⁶ Clausewitz, Carl von, *On War*, ed. & trans. Michael Howard and Peter Paret (NJ: Princeton University Press, 1976), 595-596.

characteristic of arguably any Army organization. Tactical wheeled vehicles are in turn a dominant characteristic of sustainment. This holds true for Army combat aviation brigades. These vehicles act as “a source of leverage” and provide the means for “freedom of action”⁷ and movement of the logistics and maintenance that supply military personnel and equipment. Without vehicles then, sustainment ceases; equipment and personnel cannot operate and the will to fight disintegrates. Sustainment vehicles influence to a large degree both physical and moral strength of belligerents. Thus, tactical wheeled vehicles exhibit a center of gravity quality in relation to aviation sustainment.

Another important facet of Army aviation sustainment, for which tactical wheeled vehicles enable, is its ability to support the modular design of the combat aviation brigade. The combat aviation brigade design enables units to be configurable in terms of organization, personnel, and equipment to support the ground commands. FM 3-04.111, *Aviation Brigades*, explains the adaptable nature of the combat aviation brigade in the Army today stating, “The role of the aviation brigade is to conduct and/or support ground maneuver through aviation operations. The brigade must prepare to fight as a whole, support brigade combat teams using pure or task-organized units, and conduct multiple independent missions requiring pure or task-organized units. Each aviation brigade is tailored for specific missions.”⁸ An aviation brigade typically organizes its subordinate units into task forces that operate throughout the operational environment conducting various mission sets simultaneously, supporting multiple ground commanders. This task organizing divides and distributes the capabilities of the brigade,

⁷ Department of Defense, JP 5-0, *Joint Operation Planning*, (Washington, DC: Government Printing Office, August 2011), III-23.

⁸ Department of the Army, FM 3-04.111, *Aviation Brigades* (Washington, DC: Government Printing Office, December 2007), 1-3.

including sustainment, to aviation task force operations. For instance, in support of an infantry division, a medical evacuation company can be located at one corner of the operational environment while the attack reconnaissance and assault task forces are located at different corners. Each aviation unit requires sustainment. Therefore, the sustainment capability must operate throughout operational environment. This means that the sustainment capability requires transport and mobility to move throughout the operational environment, whether friendly, unknown, or hostile. Here again, the sustainment capability requires tactical wheeled vehicles to traverse these distances.

In addition to enabling the modular character of aviation brigades and numerous mission sets in support of the ground command, tactical wheeled vehicles provide the means to execute another capability. These vehicles also provide a means for combat aviation brigades to perform their own force protection missions. Some of these include down aircraft recovery, forward arming and refueling point operations, and air traffic control services. Along with sustainment, these particular missions represent Army aviation's capability to mitigate tactical and accidental risk, and protect and preserve its combat power throughout operational environments.

Tactical wheeled vehicles represent a critical requirement for sustainment (maintenance and logistics), modularity, and force protection operations. These are critical capabilities of Army aviation. Army aviation in turn represents both a critical requirement and capability of the Army and Joint Force ground commanders. Army aviation tactical wheeled vehicles thus influence, to a degree, Army and Joint Force capabilities.

Tactical wheeled vehicles: a link to readiness

The combat aviation brigade's support battalion provides sustainment capability. Within these battalions, the subordinate aviation support companies provide maintenance equipment and personnel to the helicopter line companies. Besides the aviation support companies, the aviation

support battalion contains several other companies. These include a headquarters support company, a distribution company, and a network support company. The support battalion organization “provides aviation and ground field maintenance, network communications, resupply, and medical support”⁹ for the entire combat aviation brigade. Out of all the subordinate companies, the distribution company relies the most upon tactical wheeled vehicles. It essentially functions as a warehouse, what the Army refers to as a supply support area, and “distributes supplies to subordinate units of the aviation brigade.”¹⁰ The tactical wheeled vehicles of the distribution companies afford the means to transport logistics to the aviation brigade subordinate units. The aviation support battalion transports “logistics stocks that exceed the organic carrying capability of the aviation brigade battalions.”¹¹ Among the items delivered by the distribution companies are the repair parts and other maintenance supplies that aircraft maintainers require to keep aircraft within technical and safety standards. Once arrived at their destinations, aviation sustainment leaders employ tactical wheeled vehicles to emplace and distribute equipment and supplies rapidly and efficiently. The support battalion of the combat aviation brigade is “designed to place the right logistics resources at the right location at the right time.”¹² Aircraft availability for missions depends upon the support battalion’s sustainment capability, especially in the absence of civilian contractors in impermissible hostile environments.

Aircraft availability results from aviation support battalion companies managing a variety of challenges. First, maintenance operations can be either scheduled or unscheduled, as is the case

⁹ Department of the Army, FM 3-04.111, *Aviation Brigades* (Washington, DC: Government Printing Office, December 2007), 5-18.

¹⁰ *Ibid.*, 5-18.

¹¹ *Ibid.*

¹² *Ibid.*, 5-8.

with emergencies. Unscheduled maintenance or repair operations can occur “by premature or unexpected malfunction, improper operation, or battlefield damage.”¹³ Aircraft combat-expedient maintenance, battle damage assessment and repair, and downed aircraft-recovery team operations typically fall into this arena. Aviation units must have the ability to react to such occasions immediately. Tactical wheeled vehicles can play a critical role in getting to the aircraft in need, effecting repairs, and recovering the aircraft. They provide a means to transport the appropriate personnel, equipment, and parts to and from damaged aircraft in an expedient manner, even transporting the damaged aircraft back behind friendly lines where aviation maintainers await. Aviation maintainers constantly strive to overcome the challenges of unscheduled events. Secondly, however, they also strive to mitigate inefficiencies in their scheduled sustainment operations. Inefficiencies such as bottlenecks typically result in reducing the number of available aircraft to support the mission demands placed on the combat aviation brigade. The maintenance and logistics components of the sustainment capability enable the employment of available aircraft for all combat aviation brigade missions, whether for training or real world purposes. In addition to providing aircraft for aviation missions, the sustainment capability must also provide available aircraft for Army aviation officers to comply training requirements. As pilots, Army aviation officers must log a certain number and type of flight-time hours depending on their duty position and aircraft type in order to maintain pilot proficiencies.¹⁴ Lastly, although “Army aviation can expect to operate from diverse locations” conducting “24-hour operations” during deployments, the garrison and training tempo can at times be equally as high, particularly

¹³ Department of the Army, FM 3-04.111, *Aviation Brigades* (Washington, DC: Government Printing Office, December 2007), 5-15.

¹⁴ Department of the Army, TC 3-04.11, *Commander's Aircrew Training Program for Individual, Crew, and Collective Training* (Washington, DC: Government Printing Office, November 2009), 4-3.

in the train-up period before a deployment. Sustainment operations must provide available aircraft in order to keep pace with the challenges of mission demands, scheduled and unscheduled maintenance operations, and pilot required flight-times.¹⁵

Tactical wheeled vehicles: a systems picture

By current doctrine, Joint operations and campaigns will require the Army to “seize, retain, and exploit the initiative to gain and maintain a position of relative advantage in sustained land operations in order to create the conditions for favorable conflict resolution.”¹⁶ In order to do this the Army relies heavily upon its aviation as well as other service components. Army aviation, in support of the Army and Joint Force ground commanders, requires sustainment if it is to provide its missions to support ground commanders. Sustainment exerts a considerable influence over the number of aircraft available and pilot crews trained to proficiency. It provides the maintenance and logistics required to keep aircraft available for missions such as training pilots. This in turn influences the readiness, capability, and capacity of the combat aviation brigade. At the tactical and operational levels, the combat aviation brigade’s training readiness, capability, and capacity influence the degree to which it can support ground commanders, whether Army, Joint Force, or other organizational level. Combat aviation brigades strive for the most feasible number of aircraft available and trained crews conceivable in order to achieve the best readiness, capability, and capacity to support ground commanders. The Department of Defense takes note of these aspects when it receives their regular reports on these three particular areas.¹⁷ Tactical

¹⁵ Department of the Army, FM 3-04.111, *Aviation Brigades* (Washington, DC: Government Printing Office, December 2007), 3-9, 3-11.

¹⁶ Department of the Army, ADP 3-0, *Unified Land Operations* (Washington, DC: Government Printing Office, October 2011), iii.

¹⁷ Department of the Army, AR 220-1, *Army Unit Status Reporting and Force*

wheeled vehicles represent a reinforcing, and thus vital, system that interacts with the maintenance and logistics systems of sustainment. The sustainment system in turn enables and interacts with the aircraft availability and modularity systems. Aircraft availability and pilot proficiency training are systems that interact with combat aviation brigade's systems of readiness, mission capability and capacity. Just as tactical wheeled vehicles are part of the sustainment system in terms of maintenance and logistics, so sustainment is part of the aircraft availability system. Tactical wheeled vehicles are a critical requirement for Army aviation modularity and sustainment. Modularity and sustainment are vital to the combat aviation brigade ability to support ground commanders. Overcoming multiple challenges, the support battalions of the combat aviation brigade provide dispersed sustainment capabilities across operational environments. Aircraft availability and pilots trained to proficiency are part of the systems that yield readiness, capability and capacity for combat aviation brigade to support multiple ground commanders simultaneously.

Since the beginning of modern militaries, the interconnected character of warfare continues to endure. Although living in a time different in many respects from today, Clausewitz offered prudent and prescient discussion concerning the interconnected character between sustainment, capacity, capability, and readiness.¹⁸ Just as sustainment inseparably links to military operations, so too are tactical wheeled vehicles inseparable from sustainment operations. These are indelible parts of the organizational dynamics of military systems.

REDUCTION METHODOLOGY

Registration – Consolidated Policies (Washington, DC: Government Printing Office, April 2010), 11-18.

¹⁸ Clausewitz, Carl von, *On War*, ed. & trans. Michael Howard and Peter Paret (NJ: Princeton University Press, 1976), 330.

Because the tactical wheeled vehicle fleet contributes significantly to not only Army aviation but to Army operations in general, simply cutting their numbers without an informed plan on how to do so portends poor judgment and hasty decision making. Therefore, in an effort to reduce vehicle numbers without jeopardizing Army operations, detailed studies were directed. These studies were conducted around the Army to inform a reduction methodology. Despite adamant protest from Army aviation, the resulting methodology gained approval.

In this section, the monograph discusses the development of the resultant methodology behind the reduction in the Army aviation tactical wheeled fleet. First, the section explains purposes behind the reductions. Next, it transitions to the outcomes of the tactical wheeled vehicle studies conducted by force management proponents of the Army Aviation Center of Excellence. The section closes with a discussion of the final reduction methodology informed by the studies and Army aviation's response.

Tactical wheeled vehicles: the reduction decision

The Army possesses a substantial tactical wheeled vehicle fleet. At the time of this writing, the number is over 250,000 vehicles of various types and sizes. This multi-billion dollar investment represents a significant management challenge in terms of procurement, sustainment, recapitalization, and divestiture.¹⁹ The Army objective seeks to balance these lifecycle aspects with respect to payload, protection, performance, force structure, and fiscal budget limitations, while providing the best fleet blend to meet future needs. This is a continual process, even in the midst of force structure fluctuations as realized over the past decade.

¹⁹ Department of the Army, Army Truck Program (Tactical Wheeled Vehicle Acquisition Strategy) – Report to Congress June 2010, (Washington, DC: Government Printing Office, April 2001), 4.

In 2006, the Vice Chief of Staff of the Army approved a tactical wheeled vehicle strategy that included the recapitalization of light tactical wheeled vehicles, such as the High Mobility Multi-purpose Wheeled Vehicles, and a new procurement for medium tactical vehicles. The strategy also included the recapitalization of heavy tactical wheeled vehicles. For several years during the wars in Iraq and Afghanistan, the Army contended with its tactical wheeled vehicle strategy. Tension existed between keeping pace with wartime force protection demands and diminishing ability to pay for new vehicles. The Vice Chief of Staff of the Army approved a new strategy to procure new light tactical vehicles in an effort to keep pace with wartime force protection demands. The approval also occurred since the high mobility multi-purpose wheeled vehicles were nearing the end of their life cycles and possessed limited growth potential. The combination of newly procured, recapitalized, and the remaining tactical wheeled vehicles swelled the fleet to the point of exceeding statutory force structure end strength.

On March 23, 2009, the Training and Doctrine Command directed force design assessments specifically to reduce force structure. This was prompted by the fact that active component programmed force structure would exceed end strength beginning in fiscal year 2010. To address this over strength and to bring the Army force structure in balance and within end strength authorizations, the Training and Doctrine Command published their tasking to identify combinations of force design and unit level force structure offsets, and refinements to the generating force. Included in the intent of the tasking was to attain force designs that provided “commanders with versatile organizations while providing the Army with the best value for the resources invested.” The end state describes, “meeting statutory end strength authorizations ... force designs with the objective to reach streamlined, versatile and cost-effective organizations

for the challenges of the 21st Century.”²⁰ In other words, the Army wanted to simultaneously cut costs, restructure units, divest of legacy vehicles beyond utility, retain viable vehicles, and invest in phasing in new vehicles for the long term. Despite the complexity of such an undertaking, the anticipated risk level of the impact was low. In particular, part of the definition of the low risk was that “expected losses” would have “little to no impact on accomplishing the mission.”²¹

The Training and Doctrine Command designated the Army Capability Integration Center as the lead organization for the force design assessment tasking with the Training and Doctrine Command Commanding General as the overall Army lead. The Training and Doctrine Command directive assigned the tactical wheeled vehicle studies as means to inform and modify force structure designs and reduce vehicle requirements within units. As an underpinning for force design reduction, the tactical wheeled vehicle studies informed the percentages of reduction in active component structure. The tactical wheeled vehicle studies also informed the tactical wheeled vehicle Fleet Acquisition Strategy (or Army Truck Program), and established a baseline for future procurement strategies. The endstate for the tactical wheeled vehicle studies was multifaceted. First, the Army Capability Integration Center wanted to “develop a Tactical Wheeled Vehicle Strategy and Implementation Plan” that provided the war fighter “the ability to execute desired Full Spectrum Operations with:

- improved readiness, availability, and maintainability
- scalable & extensible protection

²⁰Army Training and Doctrine Command Operations Center, “TRADOC TASKORD EX508454 - HQDA Tasking to Assess Force Designs to Reduce Force Structure,” (Fort Eustis, VA, April 2009), 1.

²¹ Army Training and Doctrine Command Operations Center, “Annex C to TRADOC TASKORD EX508454 - HQDA Tasking to Assess Force Designs to Reduce Force Structure,” (Fort Eustis, VA, April 2009), C-1.

- a reduction in the logistics footprint due to improved fuel efficiency, reduced spares & tool requirements
- enhanced reliability and platform commonality”²²

Secondly, at endstate the studies would determine the “proper balance of” tactical wheeled vehicle “Payload, Performance, and Protection, by unit type and based on ... mission roles; mission profiles; and threat.”²³ The studies would also afford “a fleet management processes and practices that enable efficient and effective reset, recapitalization, or replacement decisions in order to maximize operational effectiveness and reduce overall cost.”²⁴ The last two aspect of Capability Integration Center’s endstate included a plan for “modernization of the Army’s Light Tactical Vehicle (LTV) fleet”²⁵ and ultimately influencing the Fiscal Year 2012-2017 Program Objective Memorandum.

Tactical wheeled vehicles: the reduction studies

The analysis plan for the first tactical wheeled vehicle study consisted of two phases. Phase one built upon three facets: quantity, quality, fleet management. The first study began in March 2009 with intentions of completion originally by July 2009. It originated with the Combined Arms Support Command, a subordinate command of the Training and Doctrine

²² Organization & Personnel Force Development Directorate, “Tactical Wheeled Vehicle Strategy Analysis” (Fort Rucker, AL, January 27, 2009), slide 6. [Final Tactical Wheeled Vehicle Power Point presentation brief to the Fort Rucker Capability Development and Integration Directorate (CDID)]

²³ Organization & Personnel Force Development Directorate, “Tactical Wheeled Vehicle Strategy Analysis” (Fort Rucker, AL, January 27, 2009), slide 6. [Final TWV Power Point presentation brief to the Fort Rucker Capability Development and Integration Directorate (CDID)]

²⁴ Ibid., slide 6.

²⁵ Ibid.

Command, and the Army's proponenty for tactical wheeled vehicles. As directed in the Training and Doctrine Command task order, each Army force management proponent, to include Army aviation, reviewed their respective brigade objective tables of organization and equipment documents. The proponents provided operational and risk assessments of vehicle reductions by percentage in line with the Army Forces Generation cycle model. The proponents also provided input on tactical wheeled vehicle quality options and force design alternatives. The Combined Arms Support Command collected the reviews and supporting analyses. The alternatives had to show reductions. Army aviation force management proponents developed their decrements by priority based upon aircraft maintainer experience. The priority for reductions were high density vehicles, consideration for risk to mobility and logistics in the Army Forces Generation reset, train/ready phases, and maintaining aviation mission capability or minimizing risk decrementing mobility and logistics.²⁶

Phase two of the Army Capability Integration Center's analysis plan focused on operationalizing the findings and recommendations of phase one. This entailed incorporating the recommended tactical wheeled vehicle adjustments and using war-gaming simulation to assess and refine the recommended changes to the Objective Tables of Organization and Equipment. Between July and September 2009, the Army Capability Integration Center Force Development Directorate, the Combined Arms Support Command, and Training and Doctrine Command proponents completed the first study for the Army's eight modular Brigade formations. The eight modular Brigade formations included the Medium Aviation Brigade, Battlefield Surveillance Brigade, Sustainment Brigade Headquarters, Fires Brigade, Maneuver Enhancement Brigade,

²⁶ Organization & Personnel Force Development Directorate, "Tactical Wheeled Vehicle Strategy Analysis" (Fort Rucker, AL, January 27, 2009), slide 10. [Final TWV Power Point presentation brief to the Fort Rucker Capability Development and Integration Directorate (CDID)]

Heavy Brigade Combat Team, Infantry Brigade Combat Team, and the Stryker Brigade Combat Team.²⁷ The first study applied decrements based on the Force Design Assessments for brigade and below organizations. The Army Capability Integration Center provided an analysis of all the assessments, developed and analyzed courses of action to implement vehicle reductions, and provided their recommended course of action to the Chief of Staff of the Army.

The second study specifically focused on echelons above brigade. The Combined Arms Support Command Force Development Directorate conducted the analysis, again assisted by force management proponents, “to effectively and efficiently reduce the number of tactical wheeled vehicles while maintaining operational effectiveness in the” echelons above brigade “formations in order to inform” the Army’s tactical wheeled vehicle strategy.²⁸ The second tactical wheeled vehicle study formally documented reductions previously approved in force design assessments, force design updates, adjustments in manpower allocation requirement criteria, echelons above brigade two-level maintenance, and vehicle reductions. The Training and Doctrine Command proponents approved the reductions through either Council of Colonels teleconferences or memorandums for the echelons above brigade formations.

January 2009, within an information brief to the Fort Rucker Capability Development and Integration Directorate, Army aviation force management proponents summarized their tactical wheeled vehicle study research. This included not only the first and second studies, but the third study as well that directed even more vehicle reductions. They analyzed “the

²⁷ Army Training and Doctrine Command Operations Center, “TRADOC TASKORD IN510823 - Force Development Directive (FDD) Tactical Wheeled Vehicle (TWV) Analysis Part II Planning Forum” (Fort Eustis, VA, November 2009), 1.

²⁸Ibid., 1.

operational, logistical, and training impact and risk of reducing” combat aviation brigade objective table of organization and equipment “Light Tactical Wheeled Vehicles (TWV) by 10%, 20%, and 40% throughout the” Army Forces Generation cycle.²⁹ Using the specific Army Capability Integration Center instructions and Army Regulation 220-1³⁰ for their analysis, Army aviation force management proponents determined that the required ten percent reductions in tactical wheeled vehicles for Combat Aviation Brigades resulted in an “overall Combat Aviation Brigade rating” of “C2 with minor to medium risk.”³¹ The ‘C’ refers to the overall “assessment of unit’s readiness to accomplish its core functions and provide its designed capabilities.”³² This overall assessment “is derived from four measured areas ... that indicate the availability status of resources (personnel and equipment) and unit training proficiency measured against the designed capabilities derived from the unit’s modified table of organization and equipment. The C-level assessment represents the worst case of the four measured resource areas.”³³ The number two

²⁹ Organization & Personnel Force Development Directorate, “Tactical Wheeled Vehicle Strategy Analysis” (Fort Rucker, AL, January 27, 2009), slide 4. [Final TWV Power Point presentation brief to the Fort Rucker Capability Development and Integration Directorate (CDID)]

³⁰ Department of the Army, AR 220-1, *Army Unit Status Reporting and Force Registration – Consolidated Policies* (Washington, DC: Government Printing Office, April 2010), 13.

³¹ Organization & Personnel Force Development Directorate, “Tactical Wheeled Vehicle Strategy Analysis” (Fort Rucker, AL, January 27, 2009), slides 4, 13 [Final TWV Power Point presentation brief to the Fort Rucker Capability Development and Integration Directorate (CDID)]

³² Department of the Army, AR 220-1, *Army Unit Status Reporting and Force Registration – Consolidated Policies* (Washington, DC: Government Printing Office, April 2010), 13.

³³ *Ibid.*, 13.

refers to a four tier rating scale and denotes “isolated decreases in the flexibility of choices to accomplish core functions or currently assigned missions.”³⁴

Across all reduction percentages in general, the effect of tactical wheeled vehicle reductions resulted in bottlenecked mission support and an increase in ground movements from the amount of required turns increasing. Army aviation force management summarized their risk assessment stating that the ten percent loss of vehicles would mainly impact staff and headquarters sections, and also increase turns in traveling. Their information brief states that “the loss of 720 (average 38 per Combat Aviation Brigade) light tactical vehicles primarily impacts the staff sections, command sections, and platoon headquarters of the units in the various combat aviation brigades (Heavy, Medium, Light, and Expeditionary) and increases the number of turns it requires to conduct unit movement and operational requirements. This reduction limits the medical treatment team ability to transport personnel to and from level II care.”³⁵ The minor to medium risk indicates some decrement on the required functionality of the unit in the Army Forces Generation cycle.³⁶

At the twenty and forty percent reduction levels, the analysis of the Fort Rucker force management proponents reflected readiness and capability assessments of C3 and C4, respectively, both with a high degree of risk. The high risk indicates a “medium to high impact on

³⁴ Department of the Army, AR 220-1, *Army Unit Status Reporting and Force Registration – Consolidated Policies* (Washington, DC: Government Printing Office, April 2010),16.

³⁵ Organization & Personnel Force Development Directorate, “Tactical Wheeled Vehicle Strategy Analysis” (Fort Rucker, AL, January 27, 2009), slides 4, 13 [Final TWV Power Point presentation brief to the Fort Rucker Capability Development and Integration Directorate (CDID)]

³⁶ *Ibid.*, slide 9.

units required functionality” in the Army Forces Generation Cycle.³⁷ A readiness and capability assessment of C3 indicates that the “unit possesses the required resources and is trained to accomplish or provide many, but not all, of the core functions and fundamental capabilities for which it was designed or to undertake many, but not all, portions of the mission it is currently assigned. The status of resource and training in the unit will result in significant decreases in flexibility to accomplish the core functions or the assigned missions and will increase vulnerability of the unit under many, but not all, envisioned operational scenarios. The unit will require significant compensation for deficiencies.”³⁸ Essentially doubling the effects of the ten percent reduction, the twenty percent reduction influences multiple aspects of combat aviation brigade functionality such as medical, unmanned aerial systems, communications and sustainment systems. Fort Rucker force management proponents recapitulated their assessment in their Capability Development Integration Directorate information brief stating that the “loss of 1431 (average 75 per Combat Aviation Brigade) Light Tactical Vehicles severely impacts the majority of Combat Aviation Brigade sections from performing recovery operations and command control on the move. Performing aircraft field maintenance becomes a challenge for units when transporting” aviation ground support equipment for aircraft “maintenance and trouble shooting. Vehicles used to transport” aircraft “parts to and from the” Supply Support Areas “to

³⁷ Organization & Personnel Force Development Directorate, “Tactical Wheeled Vehicle Strategy Analysis” (Fort Rucker, AL, January 27, 2009), slide 11 [Final TWV Power Point presentation brief to the Fort Rucker Capability Development and Integration Directorate (CDID)]

³⁸ Department of the Army, AR 220-1, *Army Unit Status Reporting and Force Registration – Consolidated Policies* (Washington, DC: Government Printing Office, April 2010), 16.

the flight line would require more turns for shipping and receiving. In most cases Level II care transport would not be able to be accomplished.”³⁹

At a forty percent reduction in tactical wheeled vehicle, Fort Rucker force management proponents concluded that sustainment operations are no longer tenable. The C4 readiness and capability assessment indicates that the “unit requires additional resources or training to accomplish or provide the core functions and fundamental capabilities for which it was designed or to undertake the mission currently assigned; however, the unit may be directed to undertake portions of the assigned mission with resources on hand (available).”⁴⁰ The C4 rating implies significant degradation to all mission sets without outside organizational assistance. The information brief by aviation force management proponents to their Capability Development Integration Directorate stated in summary, “the loss of 2858 (average 150 per Combat Aviation Brigade) Light Tactical Vehicles cripples units mobility and heavily impacts units in various sections to transporting of equipment and performing” aircraft “sustainment maintenance. The ability to conduct mission support is no longer capable.”⁴¹

At the end of 2010, the first completed tactical wheeled vehicle study effectively reduced the future size of its vehicle fleet in eight brigade sized deployable organizations, including the

³⁹ Organization & Personnel Force Development Directorate, “Tactical Wheeled Vehicle Strategy Analysis” (Fort Rucker, AL, January 27, 2009), slide 14. [Final TWV Power Point presentation brief to the Fort Rucker Capability Development and Integration Directorate (CDID)]

⁴⁰ Department of the Army, AR 220-1, *Army Unit Status Reporting and Force Registration – Consolidated Policies* (Washington, DC: Government Printing Office, April 2010), 16.

⁴¹ Organization & Personnel Force Development Directorate, “Tactical Wheeled Vehicle Strategy Analysis” (Fort Rucker, AL, January 27, 2009), slide 15. [Final TWV Power Point presentation brief to the Fort Rucker Capability Development and Integration Directorate (CDID)]

Combat Aviation Brigade. The Council of Colonels for Army aviation concluded on January 10, 2011 having accepted the ten percent significant reductions imposed by the Training and Doctrine Command of the first study. The second study resulted in reductions of approximately 5,900 tactical wheeled vehicles in the echelons above brigade formations, and approximately 726 personnel. The second tactical wheeled vehicle study continued to analyze echelons above brigade for reductions. In the midst of the second study, the third tactical wheeled vehicle study emerged because of further anticipated budget reduction constraints by the Vice Chief of Staff of the Army. The third study directive tasked the proponents of the Training and Doctrine Command, and the Centers of Excellence, in similar manner to the first two study directives. The purpose of the third study was essentially to find further reductions in the tactical wheeled fleet with respect to sustainment and procurement without incurring unacceptable risk.⁴²

Tactical wheeled vehicles: the final methodology

The Army Capability Integration Center consolidated and analyzed the first and second tactical wheeled vehicle studies from across the Training and Doctrine Command. It then constructed multiple courses of action for vehicle reductions to present to the Vice Chief of Staff of the Army. Army aviation force management proponents at Fort Rucker analyzed these courses of action. The Army Capabilities Integration Center recommended a pooling course of action which aligned with the Army Forces Generation model. In this course of action, combat aviation brigades do not receive their full complement of vehicles until the last phase, or available phase, of the force generation model. Vehicles are concentrated or pooled on those units in the available for deployment phase. In the first phase, known as the reset phase, combat aviation brigades have

⁴² Department of the Army, "Office of the Deputy Chief of Staff -3/5/7, TWV Study III memorandum" (Washington, DC, December 2010), 1.

approximately forty percent vehicle strength to conduct training. This equates to a readiness and capability assessment of four by Army aviation's force management analysis, and a significantly impaired ability to perform all missions, including training. In the second phase, known as the train/ready phase, combat aviation brigades have approximately eighty percent vehicle strength to conduct training. This equates to a readiness and capability assessment of two and a degree of loss to mission capability. This is particularly important to note as units that falls into this phase of the Army Forces Generation cycle not only train but also are deployable to meet contingency needs such as humanitarian assistance and other support to civil authorities. After aviation force management personnel reported their a Doctrine, Organization, Training, Materiel, Leadership, Personnel, and Facilities analysis of the courses of actions proposed, the aviation center of excellence non-concurred with reductions exceeding ten percent. The common rationale and theme was the degradation of aviation mission capability at multiple points along the Army Forces Generation cycle largely because of mobility and transportability losses.⁴³ The Fort Rucker Capability Development Integration Directorate produced a position paper following the information brief given to them by force management personnel and the emergence of the third tactical wheeled vehicle study. The directorate position paper disagreed with the further reductions beyond the first two studies proposed by Army Capability Integration Center in the third study. The position paper clearly stated that beyond the reductions of first two studies, aviation readiness rates would fall below the requirements to support the Army and ultimately break Army aviation's foundational modular organization design. The directorate recommended that the Training and Doctrine Command "conduct extensive operational analysis and modeling

⁴³ Organization & Personnel Force Development Directorate, "USSACE COA 5 DOTMLPF Challenges" (Fort Rucker, AL, January 27, 2009), slide 1. [United States Army Aviation Center of Excellence, USAACE, assessment of ARCIC's recommended course of action to the Chief of Staff of the Army]

on the impacts of all” tactical wheeled vehicle “decrements and develop an” Army Forces Generation “based management and distribution plan that effectively managed... shortfalls so as to maintain unit mobility and modular capabilities.”⁴⁴

Army aviation has gone through two tables of organization and equipment, tactical wheeled vehicle reduction iterations stemming from the Training and Doctrine Command studies. Before the force structure reductions, Army aviation already endured a mobility and transportability capability gap. In terms of supporting tactical wheeled vehicles, allocations did not accommodate items not listed on their modified tables of organization and equipment authorization documents. Without proper tactical wheeled vehicle management and distribution, this capability gap either remains or widens. Army aviation force management proponents realize that the typical mobility analyses used to identify gaps in transportability and mobility fall short. The Combined Arms Support Command, Tactical Wheeled Vehicle Requirements Mobility Office that conducts mobility analyses only considers equipment listed on the tables of organization and equipment. It does not take into consideration any additional ground support or field equipment, common stock items, as well as all items from the Common Table of Allowance⁴⁵. This includes, but is not limited to such things as tentage, heaters, camouflage netting, boards, and field desks. Compounding the issue of a mobility study, Army aviation lacks mobility requirements details within doctrinal manuals. Doctrine ultimately provides the basis for the organizational tables for equipment and personnel authorization documents. This means that

⁴⁴ Department of the Army, “Headquarters United States Army Aviation Center Of Excellence CDID Position Paper” (Fort Rucker, AL, September 2010), 1.

⁴⁵ Department of the Army, CTA 50-970, *Expendable/Durable Items* (Washington, DC: Government Printing Office, January 2005), 1. “The Common Table of Allowance (CTA) represents an authorization document for items of materiel required for common usage by individuals and/or by table of organization and equipment, table of distribution and allowances, or joint table of allowances units and activities Army wide, to include the Reserve components.”

there is no formal doctrinal basis for tactical wheeled vehicle requirements, let alone specific mobility and transportability requirements. Requirements should have traceability to doctrine.

Despite Army aviation's challenges to the vehicles reductions and requirement gaps, the effect of the vehicle reductions proceeded as directed under the recommended pooling course of action proposed by Army Capabilities Integration Center. October 1, 2012 aviation units received their new modified tables of organization and equipment authorization documents. Combat aviation units in the reset phase are currently experiencing force structure redesign as affected by the first and second tactical wheeled vehicle studies. These units are in the process of turning in excess tactical wheeled vehicles that do not align with the new organization and equipment authorization documents. The question remains whether Army aviation, beyond both the tactical wheeled vehicles and mobility studies, is still capable of meeting its doctrinal mobility and transportability requirements based on their organizational structure.⁴⁶ Further, will Army aviation maintain its modularity and sustainment capabilities in support of the Army and Joint Forces ground commanders?

CURRENT AND POSSIBLE FUTURE IMPLICATIONS

A series of interviews conducted by the author captured these professional insights of the reduction of the tactical wheeled fleet from senior Army sustainers. The author withheld the names of the individuals interviewed by mutual agreement. As subject matter experts in aviation sustainment operations, the interviewees gave their confidential professional opinions on short and long-term effects of tactical wheeled vehicle reductions for Army aviation sustainment. The

⁴⁶ Department of the Army, AR 71-32, *Force Development and Documentation – Consolidated Policies* (Washington, DC: Government Printing Office, March 1997), 19. Section 1 of the Table of Organization and Equipment is entitled "Equipment Requirements and Authorization Documents." The section "discusses the only DA documents recognized as requirements or authorization documents for unit and individual equipment."

author specifically inquired about their opinions concerning the effect of the resultant reduction methodology, discussed in the previous section, on aircraft availability training, readiness, and sustainment operations in terms of maintenance and logistics.⁴⁷ However, the interviewees provided additional relevant insights beyond the scope of the inquiry. This section organizes and discusses the interviewee insights from current and possible future perspectives in terms of positive and negative assessments.

Current Implications

Those interviewed for monograph tended to have a negative view overall of the reductions in Army aviation's tactical wheeled fleet. First, with regard to the decision to reduce and the resultant methodology to reduce vehicles, the unanimous consensus indicated a degree of shortsightedness. The explanation of one particular interviewee largely expresses the group reaction to the reductions:

Given the fact that doctrinally speaking the aviation maintenance companies require one hundred percent of the tactical wheeled vehicles assigned to move across the battle field, but are only manned to approximately seventy-five percent strength, and face further reductions based on Department of the Army Headquarters guidance, the Combined Arms Support Command, in my opinion, did not consider the proper calculations regarding PLL (Prescribed Load Listing) and ASL (Authorized Stockage List) i.e., main rotor heads, engines, blades, and bench stock levels.⁴⁸

In other words, the Combined Arms Support Command based reductions solely on the aviation brigade's table of organization and equipment. The combat aviation brigades' vehicles on the tables of organization and equipment do not account for the items on the lists mentioned. The assigned vehicles transport assigned personnel and equipment, not repair parts and lubricants. Repair parts and lubricants play an essential part in executing sustainment operations and require

⁴⁷ See APPENDIX A: INTERVIEW METHODOLOGY DESCRIPTION.

⁴⁸ Interviews with Army senior sustainment professionals, February 26, 2013.

constant transportation by tactical wheeled vehicles. Aviation sustainers already worked with fewer vehicles than needed before the reductions. For sustainers, further reductions serve only to exasperate the conditions of working with fewer vehicles to produce available aircraft for training and readiness.

Another interviewee disagreed altogether that aviation sustainers had any vehicles available and that leadership should have taken action to correct this deficiency some time ago:

First, the Aviation Battalion never had the ability to move its class 9 Air supply completely. Looking back to training rotations conducted at Ft Hood for UFTP (Unit Fielding Training Program), leadership should have questioned why an Aviation Battalion required civilian contractor line-haul to augment the movement of the Battalion in order to conduct our mission to deploy and establish combat operations. Units have historically been forced to get creative when presented with the challenge of moving the Battalion from a staging area into full combat operations.⁴⁹

Class nine supply refers to repair parts; in this case helicopter repair parts. Not having the tactical wheeled vehicles available class nine because of organizational design necessitated contracting means of transportation to fill the sustainment requirement. The interviewee gave an example of what he meant by creative:

The desert in Kuwait in 2003, units had to remove their class 9 parts from their original packaging, and condense pack their parts in order to reduce their logistic foot print by 20%-30%. This created numerous negative 2nd and 3rd order affects. Moving supply parts large distances outside of their original packaging cause many parts to be damaged in transit and ultimately rendered them no value to the unit. Once in combat operations in Iraq, the unit lacked the correct shipping container to retrograde unserviceable parts back to the rear for repair.⁵⁰

Forcing aviation sustainment to adapt increases the difficulties with which the sustainment system must operate to support the brigade.

⁴⁹ Interviews with Army senior sustainment professionals, March 5, 2013.

⁵⁰ Interviews with Army senior sustainment professionals, March 5, 2013.

The effect of fewer vehicles translates into longer turn-around time for aircraft logistics and maintenance. This means fewer available aircraft for training. Training tempo decreases and unit readiness rates decline. From a systems perspective, the reduction of vehicles represents a negative reinforcing event decreasing organic sustainment capability. Those interviewed agreed that the reductions of tactical wheeled vehicles weakened training and readiness. One interviewee stated, “Training will be crippled due the fact that units will not have sufficient tactical wheeled vehicles to conduct proper training.”⁵¹ Proper training in this sense refers to the number of flight crews maintaining required flying hours in specific mission sets and skill levels. Supporting aircraft availability and unit readiness constitutes the primary challenge of aviation sustainers.

The interviewees expressed dissatisfaction with the manner in which the Training and Doctrine Command derived the reduction methodology. Some suggested that further conclusive studies were needed before proceeding especially with regard to Army aviation. One interviewee stated, “I do not agree...At a minimum there should have been a study to analyze the second and third order effects.”⁵² This comment began with discussion concerning how Army aviation, including its sustainment systems, does not operate in the same manner as ground units, especially in regards to sustainment, yet it is still often assumed otherwise. The Army has decided to reduce vehicles across the board at a time when aviation sustainment requires more than ever because there is more equipment to be transported. As one interviewed offered, “20 years ago, Army Aviation units did not have the Standard Aircraft Towing System (SATS), Aircraft Cleaning and De-ice System (ACDS), and Aviation Light Utility Mobile Cart (ALUMC). These programs of record filled capability gaps units had acquired on their own in the past. Now in a

⁵¹ Interviews with Army senior sustainment professionals, February 26, 2013.

⁵² Interviews with Army senior sustainment professionals, February 27, 2013.

time when Army Aviation is bridging these gaps with much needed material solutions,” creating “a greater logistical footprint,” and “requiring more” tactical wheeled vehicles the “big army is reducing” their numbers.⁵³

Possible Future Implications

To meet the challenges of aircraft availability and unit readiness, aviation sustainers will increase their reliance on other means of transportation for sustainment operations. Those interviewed indicated that aviation “will become very depend on "line haul operations" which in some cases yield a loss of equipment to theft.”⁵⁴ Line haul operations refer to contracting out, or outsourcing, the transportation requirement to outside organizations. In the continental United States, transportation contractors abound, especially for government contracts. The Army has long depended upon the use of contractors to augment capacity and capability. Today, the list of contractors employed is quite extensive ranging everything from base camp protection and security, military shelters to special purpose vehicle, logistics, transportation, and supply. Even a cursory review of the plethora of areas pertaining to Army aviation sustainment from the website www.army-technology.com, and other like it, reveals an established extensive contracting support network.⁵⁵ Another notable organization that the Army has used over the decades is Kellogg-Brown-Root. This organization boasts that they are...

a leading supplier of global contingency operations, assisting U.S. military forces around the world. Our logistical support program in the Balkans - where we have provided theater-level services and temporary construction facilities for U.S. Army peacekeepers - has become the benchmark for the Department of Defense (DOD) logistics-training

⁵³ Interviews with Army senior sustainment professionals, March 5, 2013.

⁵⁴ Interviews with Army senior sustainment professionals, February 26, 2013.

⁵⁵ Army-technology.com, “Products & Services,” <http://www.army-technology.com/contractors> (accessed October 1, 2012).

program. Our life support, rapid response delivery and sustainment support capabilities have been tested and proven in Iraq, where KBR constructs facilities and manages infrastructure for the U.S. military, built under the Logistics Civil Augmentation Program (LOGCAP).⁵⁶

Another resource for Army contracting includes investment in the economies of the nations that Army aviation resides in during deployment. Paying for sustainment services from local vendors, foreign or domestic, is also something that the Army has successfully done to augment sustainment operations in recent history. The U.S. Army employed local vendors for their trucks, trailers, and cranes of various varieties in Iraq. This type of arrangement continues today in Afghanistan. Not only during deployments but also, in the U.S., the Army often successfully employs commercial means to augment their sustainment operations. However, in future non-permissive deployed operational environments, the selection of organizations capable of transporting essential sustainment items safely and securely may be few. Missing or stolen items will not only cost unit time and money, but training and readiness as well.

With respect to training and readiness interviewees expressed concern about the ability of Army aviation's to self deploy. Ground sustainment vehicles enable the quick responsiveness of the combat aviation brigade. This capability diminishes with the reduction of the wheeled fleet. One interviewee expressed his assessment of the future stating, "I believe that this will definitely impact training and readiness in an aviation brigade if we decide to downsize or adjust the amount of wheel vehicles in a combat aviation brigade. We need these vehicle to be able to self deploy and be ready to execute at a moment's notice and not have to prioritize on what equipment needs to be moved first versus last."⁵⁷

⁵⁶ KBR, "Logistics Support," <http://www.kbr.com/Services/Logistics-Support/> (accessed October 1, 2012).

⁵⁷ Interviews with Army senior sustainment professionals, March 11, 2013.

Another concern that Army aviation sustainers have for the future is the increased burden on units as well as the efficacy and reliability of outside organizations supporting sustainment operations. One interviewee states, “If the Army is going to reduce the amount of vehicles in a combat aviation brigade then they must reduce the equipment/personnel/support to accommodate that unit.”⁵⁸ If this does not occur, then aviation capability will noticeably wane:

I believe that it will affect organic capabilities of aviation sustainment if we lose those assets. We won't be able to execute the mission 100% if we are reduced wheeled vehicle. One example I will give you is my experience in an ASB. There is so much equipment and personnel that if we reduce the vehicle we will have a very difficult time deploying equipment to the ports and to the battle field. Right now the ASB units are short on vehicle to move equipment. If we continue to reduce that means either commercial or other outside units will have to be prepare to move equipment for the aviation units and I don't see that happening 100%.⁵⁹

Though the preponderance of interviewee insights indicated negative implications, positive implications offered a reasonable expectation for the future. Currently, nothing in Army publication identifies the transportability and mobility requirement for combat aviation brigades. However, as one interview suggests, this may change in the future. He states, “Bottom line up front, someone will have to address aviation vehicles requirements after all the reductions are made. The only thing positive I see from these reductions is HQDA will finally see what a real requirement is once the warfighter is not able to move its units across the battle field (Aviation units only).”⁶⁰ This statement implies that requirements will eventually be hammered out as Army aviation units struggle with achieving their end states with less tactical wheeled vehicles. The reductions may serve aviation proponents as a forcing function and as leverage to prove what the vehicle studies tried to stress.

⁵⁸ Interviews with Army senior sustainment professionals, March 11, 2013.

⁵⁹ Interviews with Army senior sustainment professionals, March 11, 2013.

⁶⁰ Interviews with Army senior sustainment professionals, February 27, 2013.

Interviewees generally agreed with the Training and Doctrine Command's idea of achieving short-term economic gains by removing those vehicles beyond their life cycle viability. Many legacy tactical wheeled vehicles simply remained parked in the motor pool areas of combat aviation brigades. These vehicles tend to have one maintenance problem after another as replacing old parts with new ones inevitably causes other parts to be replaced. These vehicles simply provide no value added to the organizations they are assigned; they are 'dead weight.' However, the possibility exists that once legitimate formal requirements are identified, more vehicles may be purchased to mitigate the transportability and mobility gaps. Short-term gains could turn into long-term losses.

Another area discussed during interviews concerned Army aviation partners. "Yes," offers one interviewee, "I see a greater reliance on inter-service or even coalition partners to help meet transportation requirements."⁶¹ The joint community provides another viable option to mitigate the challenges presented by the tactical wheeled reductions. Army aviation routinely works with other services already, providing its range of mission sets to achieve overall operational and strategic objectives. In such joint environments, completing the mission relies upon the mutual support of not only decisive and shaping operations, but sustainment operations as well. Although Army aviation differs in many respects to the other service sustainment operations, there is still the common need for tactical wheels vehicles of all variety. This commonality exists in the coalition setting as well. Army aviation can creatively plan in conjunction with joint or coalition partners to fulfill its sustainment mobility and transportability critical requirements. Since the combat aviation brigade, by design, tailors and establishes aviation battalion task forces to fit the operational needs of the ground forces commander, it

⁶¹ Interviews with Army senior sustainment professionals, February 27, 2013.

makes sense to incorporate aviation sustainment into the overall ground forces commander sustainment operation. A combination of integrated contractor support, joint, and, in some cases, even coalition sustainment operations provides another viable option to mitigate the challenges presented by the tactical wheeled reductions. Ideally, the integration of these provides the most cogent means of mitigating the mobility and transportability gaps inherent in reducing tactical wheeled vehicles in Army aviation. A key to realizing such complicated integration is the necessarily precise collaborative sustainment planning effort.

Insight Summary

The interviews conducted reveal several things. First, resultant methodology used to reduce tactical wheeled fleet did not consider the differences in Army aviation and ground sustainment operations. The reductions in the tactical wheeled fleet may produce short-term gains by divesting of obsolete equipment. However, in the long-term there may be losses because of the costs of providing the necessary means to transport items beyond organizational design. Second, the reductions may also force the formal codification of transportation and mobility requirements for Army aviation sustainment; subsequently forcing the force design of the combat aviation brigade to be adjusted accordingly. Third, reducing the vehicle fleet essentially makes the sustainment mission more difficult. This difficulty produces pervasive effects of organizational training and readiness. Interviewees also pointed out that without external support from either contractor or integrated sustainment with other services or militaries, the reduction of tactical wheeled vehicles in Army aviation results in systemic degradation of sustainment operations. Degradation results from the expansion of the mobility and transportability capability gaps. However, external support from contractor or other in the form of trucks, trailers, vans, and the like can all help to close the mobility and transportability capability gaps, widened by tactical wheeled vehicle reductions, and improve sustainment operations overall. Army aviation

sustainment, complemented with contractors and others, improves in achieving the fundamentals of sustainment such as responsiveness, continuity, improvisation, and economy.⁶²

SUSTAINMENT CASE STUDIES

Sustainment systems, consisting of both logistics and maintenance, equip and aid in the training and readiness of military organizations. Sustainment acts as part of a system that prepares military organizations with the skills to serve the interests of their nations. This is no less true for Army aviation. As an organization, combat aviation brigades rely on their sustainment system to support their training, readiness, capability, and capacity. Aviation sustainment organizations, in turns, rely upon its tactical wheeled vehicle fleet as a critical part of their system. What happens when the capability and capacity of a sustainment system wanes? Two historical case studies provide some perspective by illustrating the catastrophic systemic effects of inadequately equipping and training forces in the face of conflict. In the future, Army aviation may realize similar effects wrought by the holistic consequences of a reduced tactical wheeled vehicle fleet and the subsequent reduction in sustainment capabilities. The case studies begin with a brief overview of the historical context and then transition to arguing how impaired sustainment contributed to defeat. The first case study considers Field Marshal Slim during World War II. In his book, *Defeat into Victory*, Slim, then a Major General commanding the 1 Burma Corps from March to May 1942, recalls his experience of defeat at the hands of the Japanese. The second case study considers the Battle of Osan from the Korean War where the United States suffered arguably one of its worst defeats in its military history.

⁶² Department of the Army, ADP 4-0, *Sustainment* (Washington, DC: Government Printing Office, July 2012), 3.

The Burma Defeat: Caught unprepared

During World War II, in the South-East Asian Theatre, the Burma Campaign endured from January 1942 to July 1945. An alliance of British Commonwealth, Chinese, and United States forces fought against Imperial Japan. The empire's forces consisted of not only Japanese, but Thailand and Indian National Army forces as well. Initially, the Japanese objectives in Burma focused on the capture of the Burma capital and principal seaport city of Rangoon. This objective served to sever the overland line of communication to China. It also provided a strategic strongpoint to defend Japanese territorial gains in Malaya and the Dutch East Indies. Unexpectedly, in January 1942, the Japanese Fifteenth Army, consisting of two infantry divisions, attacked through dense jungle mountain ranges into southern Burma. Next, the Japanese successfully attacked to capture the port town of Moulmein at the mouth of the Salween River. They then advanced northwards, leveraging their superior interior lines of communication and outflanking successive British defensive positions. On March 7, 1942, the Japanese eventually overran allied forces that tried desperately to defend Rangoon awaiting reinforcements, but could not because of heavy losses. The remnants of Burma Army broke out to the north, narrowly escaping encirclement. After the fall of the capital city and the integration of Chinese reinforcements, the allies attempted to defend the northern part of the country. However, despite these reinforcements, the Japanese, who also received reinforcements after Rangoon, once again defeated the allied forces. At this point, the allies' had culminated. A defense of Burma was no longer tenable. The Allied commanders ordered a withdraw of their forces from Burma.

What caused the defeat and culmination of the allied defense? The defeat and subsequent withdrawal from Burma resulted for multiple reasons. Each commander of the coalition forces faced enormous challenges both inside and outside their organizations. As part of the Allies, Major General Slim took note of the significant challenges he faced from the onset of his command of the I Burma Corps. He wrestled with a myriad of important issues including forming

a unified corps, identifying the overarching aim of his corps, and how to seize the initiative from the Japanese. However, overarching to these and perhaps one of the most significant challenges he faced was meeting the Japanese with ill-prepared and poorly sustained forces. In the future, the United States Army and its combat aviation brigades may appreciate first hand a similar paramount challenge.

Slim stated, “We were ill-trained and ill-equipped for jungle warfare” and that “Combat units were becoming much below strength in man and equipment.”⁶³ This unpreparedness and poor state of sustainment contributed directly to what Slim believed to be his greatest peril, the utter loss of morale. He explains, “Our last and most fundamental danger would be collapse of morale in our own troops. Morale depends on so many things: spiritual, intellectual, and material.” In addition, he states, as is reminiscent of the great military of the past, “The most important thing about a commander is his effect on morale.”⁶⁴ His efforts to maintain morale within his corps while planning to seize initiative stumbled consistently over limited logistics and maintenance capability. He wanted victory to any degree against the Japanese Imperial forces but repeatedly fell short because of the sustainment hindrances he faced. Slim states, “The broad conclusion of my survey of the situation was the not very brilliant or original one that what was required for morale. We had a chance of getting this, I thought, if we could bring over the 1st Burma Division, reorganize the 17th, and carry out the overdue maintenance on our tanks, so that we could hit back with a united corps.”⁶⁵ The challenges of readiness constantly beset Slim and ultimately led to his defeat and subsequent withdrawal from Burma. In particular, the lack of

⁶³ William Slim, *Defeat into Victory* (Cooper Square Press. New York, NY. 2000), 29.

⁶⁴ *Ibid.*, 36.

⁶⁵ *Ibid.*, 37.

sustainment capability proved to be the fundamental contributor. Slim emphasized, “There were certain basic causes for our defeat. The first and overriding one was lack of preparation...A most obvious instance of the lack of preparation was the smallness and unsuitability of the forces provided to defend Burma.”⁶⁶

Clausewitz captures the narrative of the Burma defeat in his discussion on sustainment, “Strength ebbs away, retreat becomes unavoidable, and gradually the signs of genuine defeat appear.”⁶⁷ Though vastly differently in many respects to Army aviation today, Field Marshall Slim found himself in a situation that Army aviation will perhaps face in the future with regard to readiness, capability, sustainment, and even morale. These four areas represent interconnected systems essential to military organizations. Seizing and maintaining the initiative in conflict hinges on operational reach that training, readiness, and sustainment support. Maintaining morale also depends upon the ability of an organization to achieve necessary objectives. Reaching these objectives relies on the means that sustainment and training afford. Major General Slim’s defense of Burma culminated because of many factors; the sustainment capability linked to them all.

Korean Conflict: Underestimation and defeat

In the summer of 1950, North Korean surprised the United States by attacking South Korea with a force that proved to be overwhelming. The North Korean People's Army invaded the Republic of Korea with ten divisions, a force totaling almost 90,000 men. The smaller South Korean army suffered from widespread lack of organization and equipment, and was unprepared

⁶⁶ William Slim, *Defeat into Victory* (Cooper Square Press. New York, NY. 2000), 115.

⁶⁷ Clausewitz, Carl von, *On War*, ed. & trans. Michael Howard and Peter Paret (NJ: Princeton University Press, 1976), 303.

for war.⁶⁸ North Korean forces quickly defeated South Korean forces of only 38,000 soldiers in defense. The North Koreans were able to move southward relatively unhindered and capture Seoul, the capital of South Korea's capital by the end of June. Instead of surrender, the republic's government, fled south. In response to North Korean aggressive open act of war and forestall the demise of South Korea the United Nations Security Council voted to send military forces. The United States, under the Truman administration, entered the situation first with naval blockades and airstrikes. Sending ground troops from the 24th Infantry Division of the Eighth Army in Japan followed this response. However, U.S. military reductions post World War II rendered the division below strength. In addition, their equipment was out of date.⁶⁹ The Division commander, Major General William F. Dean sent the 1st Battalion, 21st Infantry, under the command of Lieutenant Colonel Charles B. Smith. Deploying quickly by air, Smith's mission was to block the North Korean advance in order to allow time for follow on forces to deploy by sea into South Korea.⁷⁰ Task Force Smith, named after the battalion commander, consisted of little more than two infantry companies and an artillery battery. Known as the Battle of Osan, Task Force Smith engaged in the first United States fighting action in the Korean War. The task force was able to delay the North Korean southward advance for seven hours. Unfortunately, the cost of this mission was a forty percent casualty total.⁷¹

Why did Task Force Smith incur such losses at the hands of the North Koreans? How

⁶⁸ Bevin Alexander, *Korea: The First War we Lost* (NY: Hippocrene Books, 2003), 1.

⁶⁹ Michael J. Varhola, *Fire and Ice: The Korean War, 1950–1953*, (MA: Da Capo Press Cambridge, 2000), 3.

⁷⁰ Allan R. Millett, *The War for Korea, 1950–1951: They Came from the North* (University Press of Kansas, 2010), 135.

⁷¹ *Ibid.*, 138.

does this relate to the challenges presented by the systemic effects of Army aviation's tactical wheeled fleet reductions? There were many particular systemic reasons why Task Force Smith incurred such losses. The reasons stemmed from a gross under estimation of North Korean capability and post World War II drawdown implications of U.S. forces. Some of reasons include outdated equipment, North Korean superior numbers and equipment, lack of discipline, training and experience, and even leadership. However, the sum total of these organizational causal factors equates to a lack of overall systemic preparedness. This lack of preparedness is the basis for the similarity between Army aviation's current challenge and the challenge that faced Task Force Smith at the Battle of Osan.

Within Task Force Smith, the 1st Battalion, 21st Infantry had only its Bravo and Charlie line companies. Typically, a U.S. Army battalion consists of three line companies. The battalion headquarters, the communications platoon, and the heavy weapons platoon operated at half strength at start. Besides the inadequacies of personnel numbers and proper equipment, the task force also faced the challenge of indiscipline and inexperience. Though youthful and brave, the majority of task force soldiers possessed too few years and no combat experience. Their training consisted of only Army basic training.⁷² In addition, merely a fraction of the officers in Task Force Smith possessed combat experience from World War II.⁷³ Soldiers were only equipped with 120 rounds of ammunition each and two days of rations. Weapon systems that the task force possessed were simply not effective against the armor of the North Korean tanks. The heavy weapons platoon was only equipped with six outmoded bazooka rocket launchers, two seventy-five millimeter recoilless rifles, two 4.2 inch mortars, and four sixty millimeter mortars.

⁷² Bevin Alexander, *Korea: The First War we Lost* (NY: Hippocrene Books, 2003), 53.

⁷³ *Ibid.*, 55.

Compounding the problem was the fact that much of this equipment was not their own. A large portion of it was drawn from the already under-strength task force artillery battery. The battery possessed all of six one hundred five millimeter howitzers.⁷⁴ Although these howitzers were equipped with 1,200 high explosive rounds, they were unable to defeat North Korean tank armor. Rounds at the time that were capable of penetrating tank armor were the High Explosive Anti-Tank rounds. Unfortunately, Task Force Smith only received six of these particular rounds.⁷⁵ To sum, the task force was inadequately equipped, trained, manned, and sustained.

The 400-man task force sent to delay the north needed 1950-modern anti-tank weaponry instead of the relatively small quantities of high-explosive artillery rounds, obsolete 2.36-inch rocket launchers, and 57mm recoilless rifles they had on-hand. This equipment proved ineffective against the North Korean tank columns that consisted of ex-Soviet T-34/85 tanks. Unhindered by the ill-equipped U.S. forces, the North Korean tanks overran the task force positions in their movement south. After the North Korean tank column passed, the next target was the advancing infantry column. This is where the U.S. forces were able to delay the North Korean advance before sheer numbers overran their positions. The order to withdraw came when Lieutenant Colonel Smith realized that his force was facing encirclement. Sadly, the hasty withdraw became a deadly rout where the highest U.S. casualties were suffered. In large part, these unfortunate losses resulted from a lack of proper sustainment, both in quantities and type of equipment.

The Battle of Osan fought between North Korean forces and Task Force Smith serves to illustrate the disastrous results of underestimation and systemic improper preparedness pursuant to a postwar army drawdown. The U.S. Army World War II drawdown and underestimation of

⁷⁴ Allan R. Millett, *The War for Korea, 1950–1951: They Came from the North* (University Press of Kansas, 2010), 135.

⁷⁵ Bevin Alexander, *Korea: The First War we Lost* (NY: Hippocrene Books, 2003), 58.

North Korean capability led to a degraded sustainment system in terms of U.S. personnel and equipment. Multiple causal factors highlighted the reasons for the U.S. defeat. Outdated World War II equipment proved wholly inadequate to challenge North Korean armor. Bazookas and high explosive artillery rounds did not penetrate the North Korean tanks. Novice soldiers in terms of training and experience as well as the relative low quantity of soldiers proved inadequate as well.⁷⁶ The North simply demonstrated a conventional overmatch in terms of equipment and personnel. The weaknesses of U.S. forces work to the advantage of the North who was able to exploit it with their strength. A lack of wartime proper readiness presents adversaries with an opportunity for exploitation. Ultimately, this exploitation could lead to a significant defeat.

The U.S. Army combat aviation brigades lack of readiness may occur in a similar manner, especially in light of post war draw down constraints. The weakness or vulnerability of one opponent presents a potential exploitation opportunity and leverage point to the other opponent. A degraded sustainment system capability, represented by the post war reductions in organic tactical wheeled vehicles, may be an exploitable weakness by U.S. adversaries in the future. The sustainment system capability interacts with training, readiness, capability and capacity of a military organization. Adversaries seeking to strike any one or all of these systems have merely to target sustainment. In light of the Battle of Osan and Task Force Smith, and considering the potential systemic effects, an underestimation of sustainment degradation may have disastrous consequences. Furthermore, considering sustainment as a center of gravity, Clausewitz plainly states, “This is the point against which all our energies should be directed.”⁷⁷

⁷⁶ Allan R. Millett, *The War for Korea, 1950–1951: They Came from the North* (University Press of Kansas, 2010), 138.

⁷⁷ Clausewitz, Carl von, *On War*, ed. & trans. Michael Howard and Peter Paret (NJ: Princeton University Press, 1976), 596.

Sustainment, if viewed by U.S. adversaries as a targetable center of gravity, especially as the Army grapples with post war drawdown, potentially presents an exploitable weakness and opportunity.

CONCLUSION

This monograph concludes that operational defeat and catastrophic failure are an ultimate systemic effect of degraded sustainment. If left unaltered, the degradation of any critical system within a larger organization inclines the entire organizational system towards failure. Sustainment is clearly a critical system with a military organization. As explained in the first section of the monograph, organic tactical wheeled vehicles contribute largely to combat aviation brigades. They enable modularity, and are simultaneously a center of gravity and critical requirement for aviation sustainment operations. From a systems perspective, tactical wheeled vehicles support sustainment, which in turn, support the equipping, training, readiness, and capability and capacity of Army combat aviation brigades. These effects upon Army aviation ultimately influence Army and Joint operations, specifically with respect to Army aviation employment in the future.

Although reducing the tactical wheeled vehicle fleet of Army aviation may have some advantages, the disadvantages need further comprehensive analysis. The transport and mobility requirements for Army aviation sustainment need detailed updating in doctrine and regulation so that the organizational design meets the expectation. These requirements need clear articulation. Reducing the ground vehicle fleet for Army aviation may solve some problems, but it also creates or exasperates existing ones. Army aviation's increased dependence upon external support to deliver its capabilities translates into the Army becoming more dependent upon external support in the future. The money saved now in reducing the wheeled fleet will potentially go to paying for necessary external support in the operations of the future. Ultimately, short-term savings potentially can lead to unintentional long-term expenditures or worse catastrophic mission

failures. There must be balance in the system to prevent failure. If relying upon commercial and civilian contract, inter-service, or allied nation support is the Army expectation, then this needs formal codification in doctrine and regulation. Contract support and integrated sustainment with other services or militaries' assets allow Army aviation sustainers to have tactical wheeled vehicles on-hand not only for scheduled events, but also for unscheduled events such as catastrophic losses of ground vehicles or aircraft. Creatively integrated support assists in maintaining the decisive advantage that sustainment operations can afford the Army or Joint ground forces commander.

APPENDIX A: INTERVIEW METHODOLOGY DESCRIPTION

The author sought through electronic and telephonic means the professional opinions of individuals within Army aviation who possessed approximately twenty years or more of sustainment experience. Those willing to give an interview were given a consent form to sign in accordance with the Command and General Staff College policy for interviewing human subjects. The format of the consent form memorandum is provided on the next page. Those interviewed held ranks from E-7 to CW5. The author captured the professional insights regarding the reduction of the tactical wheeled fleet from five senior Army sustainers through both telephonic and electronic means. The names of the individuals interviewed were withheld by mutual agreement. When asked as subject matter experts in aviation sustainment operations, the interviewees gave their confidential professional opinions on short and long-term effects of tactical wheeled vehicle reductions for Army aviation sustainment. The author specifically inquired about their opinions concerning the effect of the resultant reduction methodology on aircraft availability training, readiness, and sustainment operations in terms of maintenance and logistics.

MEMORANDUM FOR Commander, US Army Human Resources Command, ATTN: AHRC-PDP-I, 1600 Spearhead Division Avenue, Fort Knox, Kentucky 40122

SUBJECT: Consent to Participate in Research

1. You are being asked to participate in a research study. The purpose is to gain the insight of those who possess professional knowledge of Army aviation sustainment operations. The procedure is to pose the questions to the interviewees and record their responses. It will take no more than 1 hour of the interviewee's time. There is minimal foreseeable risks, discomforts, or benefits of the research as your participation will be confidential. You will not be identified in the results or any document presenting the findings of this interview. You may end your participation at any time and remove all information provided from the study. There are other people participating in the study through the same interview process.

2. Your participation in this research is voluntary and confidential.

3. If you agree to participate, please sign this document. A copy is provided to you.

4. You may contact me at 254-371-1689 any time should you have questions about the study. You may also contact me via email at gary.gonzalez1@us.army.mil. You may contact Maria Clark, CGSC Human Subjects Protections Administrator at maria.l.clark.civ@mail.mil should you have concerns or questions regarding the conduct of this study.

5. Signing this document means that the research study, including the above information, has been described to you orally, and that you voluntarily agree to participate.

Signature of participant date

Signature of witness date

GARY H. GONZALEZ
MAJ, AV

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